

# Math 213 Lecture 2 4-8-20

Parameter  $t$  for time  
can be anything

Any third variable such as  $\theta$

$$x = x(\theta)$$

$$y = y(\theta)$$

#13 try to elim  $\theta$

1. add / subtract first

$$\text{isolate } (\cos \theta)^2 + (\sin \theta)^2 = 1$$

$$x = 3 - 2 \cos \theta \Rightarrow x - 3 = -2 \cos \theta$$

$$y = -5 + 3 \sin \theta \Rightarrow y + 5 = 3 \sin \theta$$

$$\left(\frac{x-3}{-2}\right)^2 = (\cos \theta)^2$$

$$\left(\frac{y+5}{3}\right)^2 = (\sin \theta)^2$$

$$\frac{(x-3)^2}{2^2} + \frac{(y+5)^2}{3^2} = 1$$

$$\begin{matrix} \uparrow \\ x-\text{rad}=2 \end{matrix}$$

$$\begin{matrix} \uparrow \\ y-\text{rad}=3 \end{matrix}$$

this is cartesian  
eqn having  
eliminated the  
parameter

Ex]  $\sqrt{x^2 + y^2} = 3 \rightarrow$  Circle radius 3

#43  $x = 2\cos(3t)$

$y = 2\sin(3t)$

$$\left(\frac{x}{2}\right)^2 = (\cos(3t))^2$$

$$\left(\frac{y}{2}\right)^2 = (\sin(3t))^2$$

$$= \boxed{\frac{x^2}{2^2} + \frac{y^2}{2^2} = 1}$$

→ Circle

DO WE  
DO ANYTHING  
TO  $3t$

$$\cos(3t)^2 + \sin(3t)^2 = 1$$

AS LONG AS  
THEY ARE  
THE

$$1 = \frac{s(2+2)}{s} + \frac{s(e-x)}{s}$$

↑      ↑  
Exterior      Interior